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COVID-19 vaccination intent, perceptions, and reasons for not vaccinating among groups prioritized for early vaccination, United States, September 2020

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Summary

As of January 8, 2021, there have been more than 21 million cases and more than 300,000 deaths from coronavirus disease 2019 (COVID-19) in the United States (1). High vaccination coverage against COVID-19 will be crucial in controlling and ending the pandemic (2). Federal agencies partnered with public and private sectors to establish Operation Warp Speed (3) to facilitate and accelerate the development, manufacturing, and distribution of [COVID-19 vaccines](#) (4), with two COVID-19 vaccines being authorized by the Food and Drug Administration for use under an Emergency Use Authorization (EUA) in December 2020 (4). The Advisory Committee on Immunization Practices (ACIP) has issued interim recommendations for COVID-19 vaccine allocation, with initial limited supply of vaccines recommended for healthcare personnel and residents of long-term care facilities (phase 1a); frontline essential workers and persons aged ≥75 years (phase 1b); and persons aged 65-74 years, persons aged 16-64 years at high risk for severe COVID-19 illness due to underlying medical conditions, and other workers in essential and critical infrastructure sectors not included in phases 1a and 1b (5,6). These groups were recommended to receive initial vaccine allocations because they have a high risk of being exposed to the virus and getting sick with COVID-19, have an increased risk for severe COVID-19 illness or perform work duties across critical infrastructure sectors and maintain the services and functions that U.S. residents depend on daily. Assessing intent to get vaccinated among all adults, especially among priority groups, is important for developing targeted messages and strategies to increase the public's confidence in COVID-19 vaccines.

During September 3 to October 1, 2020, before the first COVID-19 vaccine was authorized, the Centers for Disease Control and Prevention (CDC) conducted an Internet panel survey among a representative sample of U.S. adults (n=3,541) to examine baseline perceptions about the COVID-19 vaccine and intentions to get vaccinated among groups recommended to receive initial allocations of the vaccine and the general public. Among participants who responded they were very likely to get vaccinated against COVID-19, 59.3% said they would get the vaccine within a week if the vaccine were available today at no cost, compared to 6.8% who were somewhat likely to get vaccinated. Among those who were somewhat likely to get vaccinated, 37.2% of respondents said they would wait longer than six months to get the vaccine, compared to 2.8% who were very likely to get vaccinated.

Among the 38.1% of participants who responded they were not likely to get vaccinated against COVID-19, the main reasons reported were:

- Concerns about the side effects and safety of the COVID-19 vaccine (23.4%), concerns that the COVID-19 vaccine is being developed too fast (21.7%), and waiting to see if the COVID-19 vaccine is safe and indicating they may get it later (17.9%).

Prevalence of non-intent to get vaccinated varied by demographic factors:

- Non-intent to get vaccinated varied by age group, sex, race/ethnicity, educational level, household income level, region, Metropolitan Statistical Area (MSA status), urbanicity, and health insurance status. Younger adults, females, non-Hispanic Black populations, those with lower education or no health insurance, and adults in households with lower income levels and in rural areas were least likely to express intent to get the COVID-19 vaccine.
- Non-intent to get vaccinated was lowest among adults ≥75 years compared with adults in other priority subgroups (frontline workers, other essential workers, and adults with underlying medical conditions).

Methods

From September 3 to October 1, 2020, CDC conducted a probability-based Internet panel survey ([KnowledgePanel](#)) to assess perceptions about and intent to receive a COVID-19 vaccine among a nationally representative sample of U.S. adults aged 18 years and older (7). This activity was reviewed by CDC and was conducted consistent with applicable federal law and CDC policy.¹ The panel used an address-based sampling methodology covering nearly all households in the United States, regardless of their phone or Internet status.³ To reach a 70% cooperation rate, 5,160 out of more than 60,000 panelists in the KnowledgePanel were sent an email invitation, including a survey link, and up to seven email reminders to complete the survey were sent to non-respondents. Beginning on September 19, 2020, an additional incentive of \$5 was provided to non-responders to reach target completion rates. A total of 3,594 panelists completed the survey for a completion rate of 69.7%. After data cleaning, the final sample consisted of 3,541 respondents. Data were weighted to ensure representativeness of the U.S. population using demographic benchmarks from the 2020 Current Population Survey (for age, sex, race/ethnicity, Census region, residence in a Metropolitan Statistical Area, level of education, and household income) and the 2018 American Community Survey (for language proficiency [English or Spanish] among Hispanic respondents). All analyses were conducted in SUDAAN Callable SAS (Cary, NC) using weighted data.

The survey included questions about COVID-19 vaccination intentions, perceptions, and reasons for not receiving a COVID-19 vaccine.¹¹ Intent was assessed by the following question: "If a vaccine against COVID-19 were available today at no cost, how likely would you be to get it?" Response options were absolutely certain, very likely, somewhat likely, and not likely. Intent to receive a COVID-19 vaccination was defined as reporting being "absolutely certain" or "very likely" to receive a COVID-19 vaccination (hereafter referred to as "very likely"; non-intent was defined as reporting being "not likely." Vaccination intentions and related perceptions were stratified by mutually exclusive groups recommended for the vaccine, hereafter referred to as "priority groups." Groups were defined as Tier 1a, 1b, or 1c, corresponding to adults in phase 1a, 1b, and 1c, respectively. Subgroups were defined as specific groups within each Tier: healthcare personnel⁸ (Tier 1a); frontline essential workers^{**} and persons aged ≥75 years (Tier 1b); and persons aged 65-74 years, persons aged 16-64 years at high risk for severe COVID-19 illness due to underlying medical conditions,¹¹ and other workers in essential and critical infrastructure sectors³⁵ not included in phases 1a and 1b (Tier 1c). The survey did not collect information on long-term care residents. Analyses were conducted to provide estimates among all adults, priority groups and subgroups, and adults who were aged 18-64 years with no underlying medical conditions and were not essential workers (hereafter referred to as "adults 18-64 years"). Responses to questions on intent, perceptions, and reasons for not getting vaccinated were examined by sociodemographic characteristics and stratified by priority groups and subgroups, race/ethnicity, and urbanicity. Expected timing of vaccination was assessed among those who intend to be vaccinated.

Results

Overall, of 3,541 adults, 39.4% responded that they were very likely, 22.5% somewhat likely, and 38.1% not likely to get vaccinated against COVID-19 (Table 1a).

Download [COVID-19 vaccination intent data tables](#). [\[XLS\]](#)

Intend to get vaccinated

- Tier 1b had the highest percentage of respondents reporting they would be **very likely** to get vaccinated (43.4%) (Table 1a).
- Among priority subgroups, adults ≥75 years had the highest percentage of respondents reporting they would be **very likely** to get vaccinated (51.8%) (Table 1b).
- Among adults who said they were **very likely** to get the vaccine, more than one-half of adults would get it within a week if available to them (59.3%) (Table 2a).

Do not intend to get vaccinated

- Tier 1a and 1c had higher percentages of respondents who reported they would be **not likely** to get vaccinated (38.2% and 38.8%, respectively) compared to persons in Tier 1b (34.3%) (Table 1a).
- Among priority subgroups, non-intent to get vaccinated was highest among non-frontline essential workers (41.5%), followed by persons with underlying medical conditions (40.1%) and frontline essential workers (38.5%), and lowest among adults ≥75 years (26.3%) (Table 1b).

Variations in non-intent by priority groups and socioeconomic characteristics

Non-intent to get vaccinated differed by priority groups and select socioeconomic characteristics (Table 3a) as these examples demonstrate:

- Non-intent was highest among adults aged 50 to 64 years (42.0%), females (42.1%), non-Hispanic Black adults (56.1%), those with a high school diploma or less (47.0%), those with lower household income levels (44.0-45.1% for incomes ≤\$49,999), and those who do not have health insurance (48.7%).
- The prevalence of non-intent varied within groups. For example, among different race/ethnic groups, non-intent ranged from 32.1% among adults of non-Hispanic other races to 56.1% among non-Hispanic Black adults. Non-intent was also 47.0% among adults with a high school diploma or less compared to 23.8% among adults with more than a college degree. Furthermore, non-intent was 44.0% among adults with an annual household income of ≤\$35,000 compared to 33.5% among adults with an annual household income of ≥\$75,000.
- Non-intent was also highest among those living in the South (41.1%), non-metro areas (46.2%), or rural areas (47.1%).
- Adults who rarely or never wear a mask and those who are not likely to get the flu vaccine in the 2020-21 influenza season were also not likely to get the COVID-19 vaccine (78.4% and 67.0%, respectively).

Reasons for not intending to get vaccinated

- Among all adults, the main reasons for respondents reporting they were **not likely** to get vaccinated were concerns about the side effects and safety of the COVID-19 vaccine (23.4%), concerns that the COVID-19 vaccine is being developed too fast (21.7%), and waiting to see if the COVID-19 vaccine is safe and indicating they may get it later (17.9%) (Table 4a).
- The most commonly reported main reasons for not getting vaccinated were the same for each priority group: concerns about the side effects and safety of the COVID-19 vaccine, concern that the vaccine is being developed too fast, and waiting to see if the COVID-19 vaccine is safe and indicating they may get it later
- Among priority subgroups, concern that the vaccine is being developed too fast was highest among adults ≥75 years (28.4%) (Tables 4b-c).
- Concern about the side effects and safety of the COVID-19 vaccine was highest among adults in Tier 1a (32.6%), Hispanic adults (31.5%), and adults who are non-Hispanic other race category (29.0%) (Tables 4a-b).

Concerned about COVID-19 illness vs. vaccine

- When asked if respondents were more concerned about COVID-19 illness or side effects from the COVID-19 vaccine, more adults said they were concerned about COVID-19 illness (38.3%) than side effects from the vaccine (14.3%); however, 36.7% said they were equally concerned about both (Table 1a).

Trust vs. do not trust manufacturing or approval process

- Approximately one quarter of adults (23.4%) did not trust the COVID-19 vaccine manufacturing process; about one third (34.6%) did not trust the approval process (Table 1a).
- The sources in which respondents reported having the highest level of trust to provide accurate information about the COVID-19 vaccine were primary care providers (73.0%), nurses (67.1%), CDC (60.8%), and pharmacists (60.0%) (Table 1a).
- The sources with the lowest level of trust among all adults were news sources (17.3%), religious leaders (15.9%), and social media (4.1%) (Table 1a).

Limitations

These findings are subject to at least four limitations. First, this survey was fielded in September 2020, prior to the release of information about COVID-19 vaccine safety and efficacy based on clinical trials, and intentions to get vaccinated likely have changed since then. Second, although panel recruitment methodology and data weighting were designed to produce nationally representative results, the cooperation rate was 70% and respondents may not be fully representative of the general U.S. adult population. Third, high-risk medical conditions and essential worker status were self-reported, so there may be potential for misclassification. Fourth, some estimates may not be reliable because relative standard error was >30% or sample size <30, which were suppressed in the tables.

Discussion

In this survey, conducted in September 2020, almost 40% of the population said they did not intend to get a COVID-19 vaccination, citing concerns about safety, side effects, and the speed of the vaccine development process. While adults aged ≥75 years expressed the highest likelihood of getting vaccinated, healthcare personnel, frontline workers and other essential workers, and persons with underlying medical conditions reported being less likely to get vaccinated than adults aged ≥75 years. Better understanding and addressing the safety concerns of these groups is critical for controlling COVID-19 through vaccination programs.

Since this survey was conducted, COVID-19 cases have risen in all 50 states (1), causing significant morbidity and mortality as well as a burden on the healthcare system that treats severely ill patients (12). Recent polls suggest that non-intent to get vaccinated declined in December, with only 15% of adults reporting that they would not get the COVID-19 vaccine when it is available (13). While non-intent has declined among adults, its impact on vaccination coverage, particularly among high risk groups, is unclear. With the initial allocation of vaccines to priority groups, it is important to develop strategies to address concerns among these groups in order to increase acceptance and vaccination uptake. High vaccine uptake to achieve herd immunity is an important part of preventing the spread of COVID-19. Continuing to promote vaccine acceptance and uptake is critical in this effort.

Conclusion

The results of this survey can inform strategies to educate healthcare personnel, essential workers, and the public about the vaccine development process, the safety protocols in place, and the known effectiveness and safety of the vaccines. Healthcare providers were identified in this survey as the most trusted source of information about vaccines. Providers can use CDC-recommended strategies to talk to patients about vaccine safety and address concerns (14). Getting vaccinated is more important than ever to reduce morbidity and mortality due to COVID-19, preserve limited healthcare resources, reduce health disparities among racial and ethnic groups, and protect the public's health. As the vaccines continue to be rolled out, having high vaccination coverage across all populations, in addition to a multipronged approach to mitigation of COVID-19, may prevent the spread of COVID-19 and contribute to the end of the pandemic.

* MSA status was determined by census block group using the panelist's address. The number of panelists for whom the address is not available, zip code was used to calculate MSA status (<https://www.census.gov/programs-surveys/metro-micro.html>) (4).

¹ See e.g., 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. §241(d); 5 U.S.C. §552a; 44 U.S.C. §3501 et seq.

³ Internet-enabled devices and Internet access were provided to panel members who lacked the equipment needed to take the survey. Surveys were conducted in English and Spanish, and panel members who were non-Hispanic Black and non-Hispanic other races were oversampled to ensure a large enough sample size for group analyses by respondents' race/ethnicity.

¹¹ Questions on the survey included: 1) If a vaccine against COVID-19 were available today at no cost, how likely would you be to get it?; 2) If a vaccine against COVID-19 were available today at no cost, when would you get the vaccine?; 3) Which of the following, if any, are reasons that you are [somewhat likely or not likely] to get a COVID-19 vaccine?; 4) Among the reasons you cited, which is the main reason you are [somewhat likely or not likely] to get a COVID-19 vaccine?; 5) How concerned are you about the COVID-19 illness for yourself?; 6) How concerned are you about the COVID-19 illness for your family member(s)?; 7) How concerned are you about the side effects of the COVID-19 vaccine for yourself?; 8) How concerned are you about the side effects of the COVID-19 vaccine for your family member(s)?; 9) Are you more concerned about the severity of the COVID-19 illness for yourself, or are you more concerned about the COVID-19 vaccine side effects for yourself?; 10) How much do you trust the COVID-19 vaccine manufacturing process to develop safe vaccines for the public?; 11) How much do you trust the governmental approval process to ensure the COVID-19 vaccine is safe for the public?; 12) How much do you trust the following sources to provide accurate information about the COVID-19 vaccine?

⁸ Healthcare personnel were defined as direct and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials.

** Frontline essential workers were defined as workers who are in sectors essential to the functioning of society and are at substantially higher risk of exposure to SARS-CoV-2. Some examples include first responders (firefighters, police), education (teachers, support staff, daycare), food and agriculture, manufacturing, U.S. postal service workers, public transit workers, and grocery store workers.

¹¹ Individuals with underlying medical conditions was defined as anyone who reported having any of the following conditions: asthma, chronic bronchitis, or COPD; cancer; diabetes or pre-diabetes; heart attack, heart disease, or other heart condition; high blood pressure; nonalcoholic fatty liver disease; pulmonary arterial hypertension; kidney disease; immunocompromised state (weakened immune system from solid organ transplant or from blood or bone marrow transplant, immune deficiencies, HIV, use of corticosteroids, or use of other immune weakening medicines; sickle cell disease; obesity; cerebrovascular disease (affects blood vessels and blood supply to the brain); cystic fibrosis; neurological conditions, such as dementia; thalassemia (type of blood disorder); current smoking status, or pregnancy. Respondents aged 18-64 years reporting diagnosis with ≥1 of these conditions were classified as "high-risk" in the analyses.

³⁵ Other essential workers include those working in the following industries: transportation and logistics, food service, shelter and housing (construction), finance, IT & communication, energy, media, legal, public safety (engineers), water, and wastewater.

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